

040909I

Lead Project Scientist

Preflight

- ☒ 1. Participate in general mission briefing.
- ☒ 2. Determine specific mission and flight requirements for assigned aircraft.
- ☒ 3. Determine from field program director whether aircraft has operational fix responsibility and discuss with AOC flight director/meteorologist unless briefed otherwise by field program director.
- ☒ 4. Contact HRD members of crew to:
 - a. Assure availability for mission.
 - b. Review field program safety checklist
 - c. Arrange ground transportation schedule when deployed.
 - d. Determine equipment status.
- ☒ 5. Meet with AOC flight director and navigator at least 3 hours before take-off for initial briefing.
- ☒ 5. Meet with AOC flight crew at least 2 hours before take-off for crew briefing. Provide copies of flight requirements and provide a formal briefing for the flight director, navigator, and pilots.
- ☒ 6. Report status of aircraft, systems, necessary on-board supplies and crews to appropriate HRD operations center (MGOC in Miami).
- ☒ 7. Before take-off, brief the on-board GPS dropsonde operator on times and positions of drop times.
- ☒ 7. Make sure each HRD flight crew members have life vests
- ☒ 7. Perform a headset operation check with all HRD flight crew members. Make sure everyone can hear and speak using the headset.
- ☒ 8. Collect "mess" fee (\$2.00) from all on-board HRD flight crew members.

In-Flight

- ☒ 1. Confirm from AOC flight director that satellite data link is operative (information).
- ☒ 2. Confirm camera mode of operation.
- ☒ 3. Confirm data recording rate.
- ☒ 4. Complete Lead Project Scientist Form.
- ☒ 5. Check in with the flight director to make sure the mission is going as planned (i.e. turns are made when they are supposed to be made).

Post flight

- ☒ 1. Debrief scientific crew.
- ☒ 2. Report landing time, aircraft, crew, and mission status along with supplies (tapes, etc.) remaining aboard the aircraft to MGOC.
- ☒ 3. Gather completed forms for mission and turn in at the appropriate operations center. [Note: all data removed from the aircraft by HRD personnel should be cleared with the AOC flight director.]
- ☐ 4. Obtain a copy of the 10-s flight listing from the AOC flight director. Turn in with completed forms.
- ☐ 5. Obtain a copy of the radar DAT tapes. Turn in with completed forms.
- ☐ 6. Obtain a copy of the all VHS videos from aircraft cameras (3-4 approx.). Turn in with completed forms.
- ☐ 7. Obtain a copy of CD with all flight data. Turn in with completed forms.
- ☒ 8. Determine next mission status, if any, and brief crews as necessary.
- ☒ 9. Notify MGOC as to where you can be contacted and arrange for any further coordination required.
- ☒ 10. Prepare written mission summary using **Mission Summary** form (due to Field Program Director a week after the flight).

Lead Project Scientist Check List

Date 9/9/04 Aircraft N43RF Flight ID 040909I

A. Participants:

HRD		AOC	
Function	Participant	Function	Participant
Lead Project Scientist	<u>Rogers</u>	Flight Director	<u>Shepherd</u>
Radar	<u>Leighton</u>	Pilots	<u>Teleest, Sitak, Choy</u>
Workstation	<u>Leighton</u>	Navigator	
Cloud Physics	<u> </u>	Systems Engineer	<u>Lynch</u>
Photographer/Observer		Data Technician	<u>Smith</u>
/Guests	<u>Lasswell (Scripps) - IR</u>	Electronics Technician	
Dropwindsonde	<u>Leighton</u>	Other	<u>Walsh - SPA</u>
AXBT/AXCP	<u>Vulhorn - SFMR</u>		

B. Take-off and Landing Locations:

Take-Off: 145110 Location: St. Croix

Landing: 232022 Location: Naval AFB

Number of Eye Penetrations: 3

C. Past and Forecast Storm Locations: 5 AM 9/9 290/13

Date/Time	Latitude	Longitude	MSLP	Maximum Wind
init 9/09	13.9	70.0		140
12 9/18	14.8	72.0		140
24 10/6	16.2	74.3		135
36 10/18	17.6	76.4		125
48 11/6	19.1	78.3		125

D. Mission Briefing:

to drop multi-sound sequences ~~SPMR~~ mapping of core winds and 34- and 64-ft winds, and SPM wave fields in a CoS.

CBLAST mission into Hurricane Ivan. Depart St. Croix at 15 UTC, IP 150 nm NE of storm (see Fig. 1). Initial inbound at 8-12,000 ft, dropping sondes at 34- and 64-ft wind radii. Drop 4-sonde sequence on inner edge of eyewall, spaced 30-s apart. Fly butterfly pattern, extending 40 nm SW of storm. On NW turning leg are 100 nm, on SE leg 40 nm too. Fly at 5000 ft everywhere except during eyewall penetrations. After outbound SE leg, turn left 90 degrees and fly outward 40 nm, then turn left 90 degrees again to parallel previous leg. Fly that leg at 5000 ft for 130 nm to FP.

E. — Equipment Status (Up ↑, Down ↓, Not Available —, Not Used O)

Equipment	Pre-Flight	In-Flight	Post-Flight	# DATs / Cds /Expendables/ Printouts
Radar/LF	↑	↑		
Doppler Radar/TA	↑	↑		
Cloud Physics	O	O		
Data System	↑	↑		
GPS sondes	↑	↑		
AXBT/AXCP	O	O		
Workstation	↑	↑		
Videography	↑	↑		

REMARKS:

very hard to get max surface winds and resolve radial gradient with multi-sonde sequences, for two reasons: 1) the eye is very small (~10 nm inner eyewall) and 2) there is virtually no slope to inner eyewall. Tried shortening time to 20-s spacing, but it's still very hard. On last inbound leg, 1st drop failed on winds, but 2nd drop measured only ~65 kt BL wind. For most of the passes the final drop is essentially an eyedrop. Perhaps for inner eyewalls the slope is not as significant as storms w/out concentric eyewalls.

14 46 71 59

40

141
nm
40 101 nm

Lead Project Scientist Event Log

Date 9/9/04 Flight 040909I LPS Rogers

Time	Event	Position	Comments
145110	Takeoff	St. Croix	takeoff from St. Croix
145551	overpass	St. Croix airport	conducting 5000 ft overpass
			to calibrate downward-looking IR cam
150422	pattern	17°36' 64°46'	track 250 to storm
154740	SF winds	16°28' 67°58'	about 250 NE from eye, AOC SF about
160222	drop 1	16°10' 69°10'	drop 1 at 34-kt, 180 nm from eye
1602	at IP	16°12' 69°08'	start of IP, earlier time expected
160550	pattern	16°03' 69°24'	track 237 to eye, at 8 kft
160750	radar	15°56' 69°31'	line of strong convection 20 nm ahead
161555	radar	15°38' 70°04'	concentric eyewalls, inner 10 nm, outer
162426	radar	15°18' 70°34'	outer band (mentioned above), 40 nm,
			but then pretty calm between, rain band
			about 100 nm from eye
			just stratiform rain (mostly)
162920	SF wind	15°07' 70°52'	50-kt radius at about 65 nm
163348	drop 2	14°56' 71°09'	64-kt at 44 nm from eye
163630	radar	14°50' 71°19'	turn outer eyewall, max FL 110
164127	drop 3		drop 1 of 4-drop, vertical
164157	drop 4		eyewall, last drop was
164225	drop 5		basically an eyedrop
164252	drop 6		drop 4 of 4-drop
1644	obs	NE inner eyewall	max FL 150 kt, SF 125 kt on NE
1645	obs	SW inner eyewall	max FL 130 kt, SF 120 kt on SW
1648	Pix	14°36' 71°40'	923 mb
1647	obs	SW outer eyewall	outer eyewall max FL 100 SF 80
164955	drop 7	14°17' 72°05'	64-kt radius 24 nm from eye
165345	turn	14°09' 72°17'	turn to 095
1656	Pattern	14°02' 72°10'	meandering, b/c of new fix assignment

14 06 1110 AF
14 06 70 12
14.1 70.31643
14 36
21 407 mls water
than HAD
(100% 17%)40 nm,
rain band
about 100 nm
from eye

SF 90

kt on NE
on SW

Lead Project Scientist Event Log

Date 9/9/04

Flight 040909 I

LPS Rogers

Time	Event	Position	Comments
165729	pattern	13°56'72"07'	descent to 5 kft
171814	turn	13°29'70"53'	turn to 327 track; begin
			inbound leg
1721	SF winds	13°38'70"54'	34-kft winds, 20 nm from eye SE
1720	climb		climb to 10 kft for new
173031	drop 8	14°11'71"17'	64-kft radius at 35 nm
173228	radar	14°17'71"22'	approaching outer eyewall,
			strong conv., inner eyewall
			open on SE
1735	obs	SE outer eyewall	max FL 106 SF 92 kft
173647	pattern	14°31'71"36'	approaching inner eyewall from SE
			good mount region here
173859	drop 9		drop 1
173920	drop 10		drop 2
173940	drop 11		drop 3
174030	fix, drop 12	14°40'71"49'	center fix 920
		SE inner eyewall	max FL 140 SF 105
174249	obs	NW inner eyewall	hail, max FL 144 SF 120
1746	obs	NW outer eyewall	max FL SF
174920	SF, drop 13	15°06'72"16'	64-kft radius, 37 nm NW → NLD
175129	drop 14		backup drop, SF winds 50 kft

1716
turn to
inbound

at 1730 UTC
SE

✱

✱

✱

✱

✱

✱

✱

Lead Project Scientist Event Log

Date 9/9/09

Flight 040400I

LPS Rogers

Time	Event	Position	Comments
175530	descent	15°24' 72°35'	begin descent to 5000 ft
* 180551	drop 15	15°54' 73°07'	34-kt radius about 108 nm from eye NW
180940	turn	110 nm NW of leg	turn to 200, downwind leg
* 182037	drop 16		34-kt radius, 95 nm from eye WNW
1818	turn		turn to 105, inbound leg
182900	climb	14°58' 72°51'	climb to 8000 ft
* 183555	drop 17	14°51' 72°27'	64-kt radius, 40 nm from eye WNW
1839	obs	outer WNW eyewall	max FL 110 SF 85 kt
* 184249	drop 18	inner WNW eyewall	drop 1 of 4 drop inner WNW eyewall
* 184340	drop 19		2
* 184330	drop 20		3
* 184349	drop 21		4
184125	radar	inner WNW eyewall	heir, 55 dBZ
1844	fix	14°46' 71°59'	921 ab extrap
1845	obs	inner WNW eyewall	max FL 132 SF 120
1845	obs	inner ESE eyewall	max FL 140 SF 108
184656	radar	14°42' 71°46'	10-11 nm inner eye
184842	obs	outer ESE eyewall	max FL 100 SF 85
* 185244	drop 22	14°37' 71°27'	64-kt radius 31 nm ESE of eye
1901	descent	14°29' 70°54'	descend to 5000 ft
* 190327	drop 23	14°27' 70°47'	34-kt radius 72 nm from eye

Lead Project Scientist Event Log

Date 2/2/64

Flight 040909T

LPS Rogers

Time	Event	Position	Comments
1944 38	turn	14° 22' 70° 16'	turn to track 15
1947 25	turn	14° 47' 70° 13'	turn left to track 285
			going parallel to last
			penetration leg at 5 kft
			for Ed Walsh's SPA
1949 14	turn	15° 01' 70° 59'	turn to 330 track, moving
			further out to avoid
			outer eyewall at this altitude
1952 32	turn	15° 14' 71° 09'	turn back to track 285
1953 33	descend	15° 16' 71° 14'	descend to 3000 ft, 50 nm NE of
1942 25	radar	15° 27' 71° 58'	outer overall pentagonal
			inner one circular
1948 00	climb	15° 34' 72° 29'	climb to 5000 ft, 57 nm NNW
1958	FP	15° 45' 73° 14'	at FP, climb to
			20 kft and RTB
2320 22	landing	MacDill AFB	land at MacDill

AFN
1837
14° 44' 71° 58'
921 mb

eye

of eye

Mission Summary
Storm name
YYMMDDA# Aircraft 4³RF

Scientific Crew (4³RF)

• Lead Project Scientist Rogers
Radar Scientist Leighton
Cloud Physics Scientist
Dropwindsonde Scientist Leighton
Boundary-Layer Scientist William S. R.
Workstation Scientist Leighton
Observers

Mission Briefing: (include sketch of proposed flight track or page #)

see section D and Fig. 1.

Mission Synopsis: (include plot of actual flight track)

CBLAST mission to map out surface wind fields, perform multi-drop sequences, and fly at low levels (3-5000 ft) for SRA measurements and IR camera tests. Butterfly pattern w/ various leg lengths and altitudes (see briefing & Fig. 1). IP started early b/c wind field was so broad. Midway thru mission received special tasking from ATC for a center fix, so extended 2nd inbound leg to accommodate. Eyewall sequences were difficult to achieve b/c eyewall small and not sloped (see "Remarks" section). Were able to fly at 5 kft outside eyewall in right front, right-rear quad., and portions at 3 kft (on final leg).

Evaluation: (did the experiment meet the proposed objectives?)

Overall the mission did meet the proposed objectives. We mapped out 1st & 2nd wind fields, did 3 eyewall multi-drop sequences, dropped at 34- and 64-kft radii where possible, and flew either at 5 or 3 kft for much of the pattern outside of eyewall (on right side of storm track). Multi-sonde sequences were difficult for reasons noted above. Wind field showed: about 25-30 nm radius of 64 kft wind on left side, 35-45 nm radius on right side for 64-kft winds. Concentric eyewall pattern, outer eyewall about 40 nm, polygonal, inner eyewall about 10 nm. Max PL winds were 150 kt on NE inner eyewall, max SF winds about 125 kt in same location. SRA resolved well away of the waves at 3 kft in right front quad.

Problems: (list all problems)

only problem was w/ multi-sonde sequences (noted above). Most sondes worked fine. 5 out of 23 had winds < 20% of time. 1 sonde had no launch detected.

Expendables used in mission:

GPS sondes: 23 (5 no. on intermittent winds, 1 no launch detected)

AXBTs:

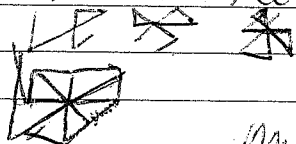
Sonobuoys:

040902I (2)

040903 and 040904 :
~~we~~ had Mike Black
 and Peter Dodge ONLY
 for those two ~~THAT~~ NHC
 tasked flights, incl LANDFALL.
 So we were too busy to write
 in here. Great flights - radar
 seemed to be working well.

040907 H. IVAN
 R. Rogers E. Uhlman & P. Leighton

STAIR - Rotating Figure 4



Mission ID: 0409A IVAN

040909I IVAN

CBLAST

Mission ID: 0409A IVAN

P. Tebeest

P. Silan

Mitchell

FE. Klippel

FD. Sheppard

P. Cury

Nar Siegel

Nar Adler

R. Rogers

E. Uhlman

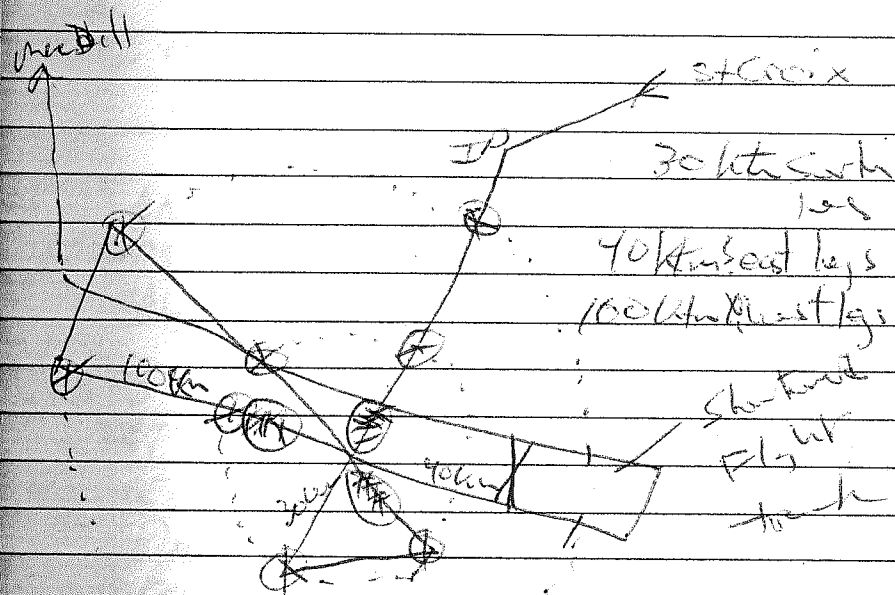
P. Leighton

J. Lissell

E. Uhlman

ET. T. Lynch

ET. T. Smith



Diags @ 34 kts and 64 kts. f. covered
 4 leg squares in eye wall out. band legs

Jan 09 I

ivan 09. ERK

9 1643

1640 - 1700

9 1740

1738 - 1758

9 1844

1832 - 1852

• - GPS sondes

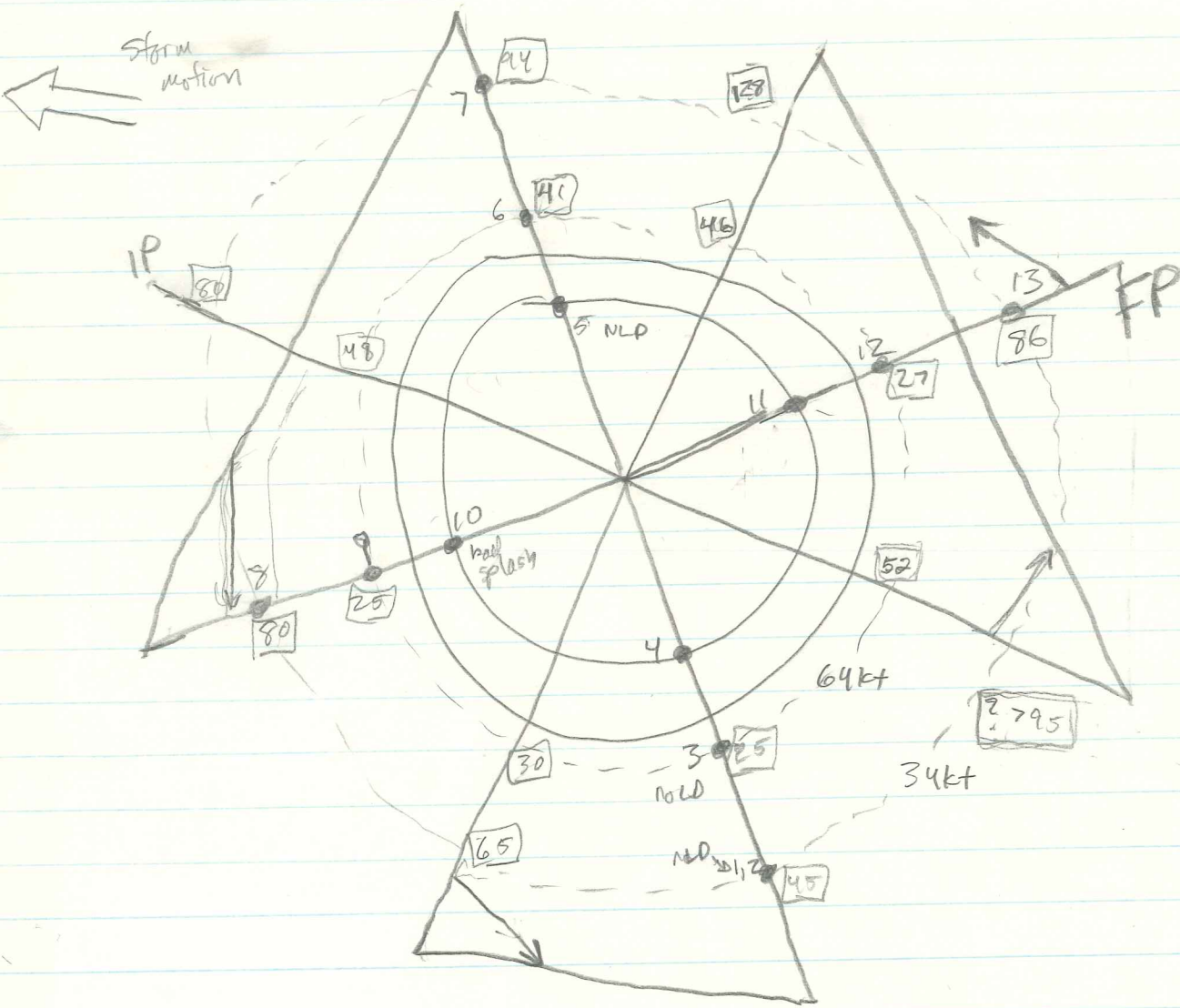


Figure 1